

Claims:

1.

A pass-through electrical connector assembly comprising:

a body;

at least one through-hole formed in said body; and

a pin forced into said through-hole and retained in said body, said pin having:

first and second ends each constructed to receive a separate wire;

an intermediate portion constructed to separate said wires and provide a seal between said wires and said pin;

a tip adjacent said first end of said pin, said tip having at least one barb constructed to engage said body when said pin is forced into said through-hole;

a head formed adjacent said second end of said pin, said head having a shoulder constructed to engage said body when said pin is forced into said through-hole; and

a circumferentially continuous surface press-fit into said through-hole of said body and forming a seal between said pin and said body.

2.

A pass-through electrical connector assembly as defined in claim 1 wherein said body is a housing constructed of plastic.

3.

A pass-through electrical connector assembly as defined in claim 1 wherein said body is a housing constructed of synthetic rubber.

4.

A pass-through electrical connector assembly as defined in claim 1 wherein said body is made of a low permeation material.

5.

A pass-through electrical connector assembly as defined in claim 1 which also comprises a flange having a hole complementary to said body and said body is received in said hole in said flange and sealed to said flange.

6.

A pass-through electrical connector assembly as defined in claim 5 wherein said body comprises a snap latch constructed to retain said body in said flange.

7.

A pass-through electrical connector assembly as defined in claim 5 wherein said body comprises a retainer sealing said body to said flange.

8.

A pass-through electrical connector assembly as defined in claim 1 wherein said body has at least two through-holes formed in said body and adjacent through-holes are axially offset relative to each other so that the shoulders of the pin received in adjacent through-holes are axially offset relative to each other.

9.

A pass-through electrical connector assembly as defined in claim 1 which also comprises at least one elastomeric seal between said pin and said body.

10.

A pass-through electrical connector assembly as defined in claim 1 wherein said pin has a separate blind hole opening into each of said ends of said pin.

11.

A pass-through electrical connector assembly as defined in claim 1 wherein said pin has a blind hole opening into one of said first and second ends and the other of said ends is solid.

12.

A pass-through electrical connector assembly as defined in claim 1 wherein said first and second ends of said pin are solid.

13.

A pass-through electrical connector assembly as defined in claim 11 wherein said second end is adapted to receive a mating terminal for a wire.

14.

A pass-through electrical connector assembly as defined in claim 12 wherein said first and second ends are each adapted to receive a mating terminal for said wire.

15.

A pass-through electrical connector assembly as defined in claim 1 wherein said circumferential surface is cylindrical.

16.

A pass-through electrical connector assembly as defined in claim 1 wherein said circumferential surface is tapered.

17.

A pass-through electrical connector assembly as defined in claim 1 wherein said tip has a frusto conical portion at said first end to facilitate insertion of said pin into said through-hole.

18.

A pass-through electrical connector assembly as defined in claim 1 wherein said tip is diametrically smaller than said circumferentially continuous surface of said pin.

19.

A pass-through electrical connector assembly as defined in claim 1 wherein the maximum diameter of said barb is larger than the maximum diameter of said circumferentially continuous surface of said pin.

20.

A pass-through electrical connector assembly as defined in claim 1 wherein said shoulder of said head is diametrically larger than said circumferentially continuous surface of said pin.

21.

A pass-through electrical connector assembly as defined in claim 1 wherein said circumferentially continuous surface of said pin is diametrically larger than said through-hole prior to said pin being forced into said through-hole.

22.

A pass-through electrical connector assembly comprising:

- a body of a non-conductive material;
- at least two through-holes each formed in said body; and
- a pin of a conductive material forced into said through-holes and retained in said body, said pin having:
 - a shank with opposed ends each constructed to receive a separate wire;
 - a portion between said wires received on said opposed ends and providing a seal between said wires and said pin;
 - a tip formed adjacent one end of said pin, said tip having at least one barb constructed to engage said body when said pin is forced into said through-hole;
 - a head formed adjacent the other end of said pin, said head having a shoulder constructed to engage said body when said pin is forced into said through-hole; and
 - an intermediate portion of said shank having a circumferential surface press-fit within said through-hole of said body thereby forming a seal between said pin and said body.

23.

A pass-through electrical connector assembly as defined in claim 22 wherein said body is made of a plastic material.

24.

A pass-through electrical connector assembly as defined in claim 22 wherein said body is received in a complementary hole in a flange and said body has a snap latch constructed to engage said flange.

25.

A pass-through electrical connector assembly as defined in claim 22 wherein said body is made of a low permeation material.

26.

A pass-through electrical connector assembly as defined in claim 22 wherein said tip is diametrically smaller than said intermediate portion of said shank.

27.

A pass-through electrical connector assembly as defined in claim 22 wherein the maximum diameter of said barb is larger than the maximum diameter of said circumferential surface of said intermediate portion of said shank.

28.

A pass-through electrical connector assembly as defined in claim 22 wherein said shoulder of said head is diametrically larger than said intermediate portion of said shank.

29.

A pass-through electrical connector assembly as defined in claim 22 wherein said maximum diameter of said intermediate portion is larger than said minimum diameter of said through-hole.

30.

A method of forming a pass-through electrical connector assembly comprising:
providing a body of a non-conductive plastic material having at least one through-hole therein,

providing a pin having a shank with opposed ends,
a tip having a barb adjacent one end,
a head having a shoulder adjacent the other end, and
an intermediate portion having a circumferentially continuous surface with a maximum diameter larger than the minimum diameter of the through-hole of the body,
inserting the tip of the pin into the through-hole and forcing the barb into and through the through-hole and the intermediate portion into the through-hole to provide an interference fit in the body providing a seal between the pin and the body.

31.

The method of claim 30 which also comprises providing a blind hole opening into the pin, inserting an electrically conductive wire into the blind hole and permanently attaching at least a portion of the wire in the blind hole to the pin.

32.

The method of claim 31 which also comprises soldering at least a portion of the wire in the blind hole to the pin.

33.

The method of claim 32 which also comprises crimping the pin to firmly engage and retain at least a portion of the wire in the blind hole.

34.

The method of claim 30 which comprises prior to inserting the pin into the through-hole, the steps of providing a blind hole in the pin which opens onto one end of the pin, inserting one end of an electrically conductive wire into the blind hole, and permanently attaching at least a portion of the wire in the blind hole to the pin.

35.

The method of claim 30 which also comprises prior to inserting the pin into the through-hole in the body, the steps of providing in the pin a first blind hole opening onto one end of the pin and a second blind hole opening onto the other end of the pin with the intermediate portion disposed between the blind holes, inserting one end of a first conductive wire into one of the blind holes, inserting one end of a separate second conductive wire into

the other blind hole, permanently attaching at least a portion of the wire in each blind hole to the pin, and subsequently inserting one of the wires into the through-hole so that after the step of inserting the pin into the through-hole of the body is completed the first and second wires extend out of and beyond generally opposed ends of the body.